

Application Serial No. 10/736,348
Amendment dated March 9, 2007
Reply to Office Action dated December 19, 2006

Amendments to the Drawings

The attached sheet of drawings includes a change to Fig. 8. This sheet, which includes Fig. 8, replaces the original sheet including Fig. 8. In Fig. 8, a previously omitted reference to locking pin 69 has been added.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes

REMARKS/ARGUMENTS

Claims 1-19 are pending. Claims 1-5, 8, 11-19 have been rejected. Claims 6, 7, 9, and 10 have been objected to.

Specification

In response to the Examiner's objection to the specification regarding the failure to depict locking pin 69 in the drawings, locking pin 69 has been properly labeled in Fig. 8. Applicant has also submitted herewith a Replacement Sheet of formal drawings and an Annotated Sheet showing the foregoing changes.

Claims Rejections - 35 U.S.C. § 103(a)

Claims 1-5, 8, and 11-19 have been rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 3,204,864 to Malaker et al ("Malaker '864") in view of U.S. Patent No. 4,627,795 to Schmitz-Montz ("Schmitz-Montz '795").

Malaker '864 discloses a cylinder suitable for gas compressors including working piston 2 secured by connecting rod 4 to crank 21. Gas to be compressed or expanded is introduced into working space 5 forming cylinder head 6 via conduits 7. At the lower end of piston 2 is larger diameter portion 8, which is received within lower end 22 of cylinder 3. Piston rings 10 are located around the upper part of piston 2 and seal piston 2 and cylinder 3 from the flow of gas into or out of working volume 5. Piston rings 11 surround pressure compensating piston 8 positioned within cylinder 9. Pressure compensating piston 8 and cylinder 9 define pressure compensating volume 12, which is filled with the same fluid that permeates working volume 5. Pressure compensating volume 12 is charged when piston 2 is in the bottom dead center position. Specifically, fluid within working volume 5 may be drawn through pipe 15, one-way valve 20, and pipe 15 into opening 16 of pressure compensating volume 12. In another embodiment, fluid may be drawn from crankcase 17 through pipe 18, one-way valve 19, and pipe 15 into opening 16 of pressure compensating volume 12.

Schmitz-Montz '795 discloses a tandem piston arrangement including rod 1 connected to crankshaft 2. Piston rod 1 defines lower cylinder 3 having guide piston 4 positioned therein. Upper cylinder 7 of piston rod 1 carries contactless piston 8, which has no lateral contact with wall 7a of cylinder 7. Between piston 8 and cylinder wall 7a is a metal labyrinth seal 9. Air drawn into cylinder 3 is precompressed and forced into a second cylinder, such as cylinder 7 of another piston assembly for multistage compression. By varying the diameters

of pistons 4, 8, compression of the gasses therein to different pressures can be achieved, with the metal labyrinth seal 9 permitting especially high pressure differentials across the length of piston 8.

Applicant respectfully submits that amended independent Claims 1, 8, and 16 are not obvious over Malaker '864 in view of Schmitz-Montz '795, as Malaker '864 and Schmitz-Montz '795, either alone or in combination, fail to disclose or suggest each and every limitation of amended independent Claims 1, 8, and 16. Specifically, Claim 1 calls for a compressor assembly including, *inter alia*, a cylinder block defining a cavity having a first cavity portion and a second cavity portion, and a piston at least partially disposed in the cavity including a first piston portion and a second piston portion, *the second cavity portion being continuously vented during reciprocation of the piston*. Similarly, independent Claim 8 calls for a compressor assembly including, *inter alia*, a cylinder block defining a cavity having first and second cavity portions being contiguously and coaxially disposed, and a piston at least partially disposed in the cavity including a first piston portion and a second piston portion, *the second cavity portion being continuously vented during reciprocation of the piston*.

Claim 16 calls for a method of compressing a refrigerant vapor, including, *inter alia*, providing a cylinder block having a first cavity portion and a second cavity portion, providing a piston having a first piston portion and a second piston portion, *the second piston portion at least partially defining a vent*, and disposing the piston at least partially within the cavity, the first piston portion defining a compression chamber within the cavity.

In forming the rejection, the Examiner relies on Schmitz-Montz '795 as disclosing a second cavity portion meeting the requirements of amended independent Claims 1 and 8, and a second piston portion meeting the requirements of amended independent Claim 16. Specifically, the Examiner relies on Schmitz-Montz '795 as disclosing a second cavity portion being continuously vented during reciprocation of a piston and a second piston portion at least partially defining a vent. However, neither the device of Malaker '864 nor the device of Schmitz-Montz '795 discloses or suggests a second cavity portion being continuously vented during reciprocation of a piston or a second piston portion at least partially defining a vent. Specifically, pressure compensating volume 12 of Malaker '864 is in communication with one of working volume 5 or crankcase 17 when piston 2 is at a

Application Serial No. 10/736,348
Amendment dated March 9, 2007
Reply to Office Action dated December 19, 2006

bottom dead center position. However, at all other times during movement of piston 2, pressure compensating volume 12 is sealed and the fluid therein compressed.

Similarly, the device of Schmitz-Montz '795 includes lower cylinder 3 that functions to precompress the fluid therein. In order to provide precompression, the cylinder must be sealed during the compression stroke. Only when the pressure within the cylinder reaches a certain point is the gas within lower cylinder 3 discharged. Thus, neither the device of Malaker '864 nor the device of Schmitz-Montz '795 disclose or suggest a second cavity portion being continuously vented during reciprocation of a piston or a second piston portion at least partially defining a vent as called for in amended independent Claims 1 and 8, and 16, respectively.

For at least the foregoing reasons, Applicant respectfully submits that amended independent Claims 1, 8, and 16, as well as Claims 2-7, 10-15, and 17-19, which depend therefrom, respectively, are not rendered obvious over Malaker '864 in view of Schmitz-Montz '795.

Applicant respectfully submits that the claims are now in condition for allowance and requests the allowance thereof.

In the event Applicant has overlooked the need for an additional extension of time, payment of fee, or additional payment of fee, Applicant hereby petitions therefor and authorizes that any charges be made to Deposit Account No. 02-0385, Baker & Daniels.

(THIS SPACE INTENTIONALLY LEFT BLANK)

Application Serial No. 10/736,348
Amendment dated March 9, 2007
Reply to Office Action dated December 19, 2006

Should the Examiner have any further questions regarding any of the foregoing, he is respectfully invited to telephone the undersigned at 260-460-1692.

Respectfully submitted,



Matthew B. Skaggs
Registration No. 55,814

Attorney for Applicants

MBS/nw


BAKER & DANIELS LLP
111 East Wayne Street, Suite 800
Fort Wayne, IN 46802
Telephone: 260-424-8000
Facsimile: 260-460-1700

Enc. Return Postcard

CERTIFICATION OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on: March 9, 2007

MATTHEW B. SKAGGS, REG. NO. 55,814
Name of Registered Representative


Signature

March 9, 2007
Date

Application Serial No. 10/736,348
Amendment dated March 9, 2007
Reply to Office Action dated December 19, 2006

APPENDIX

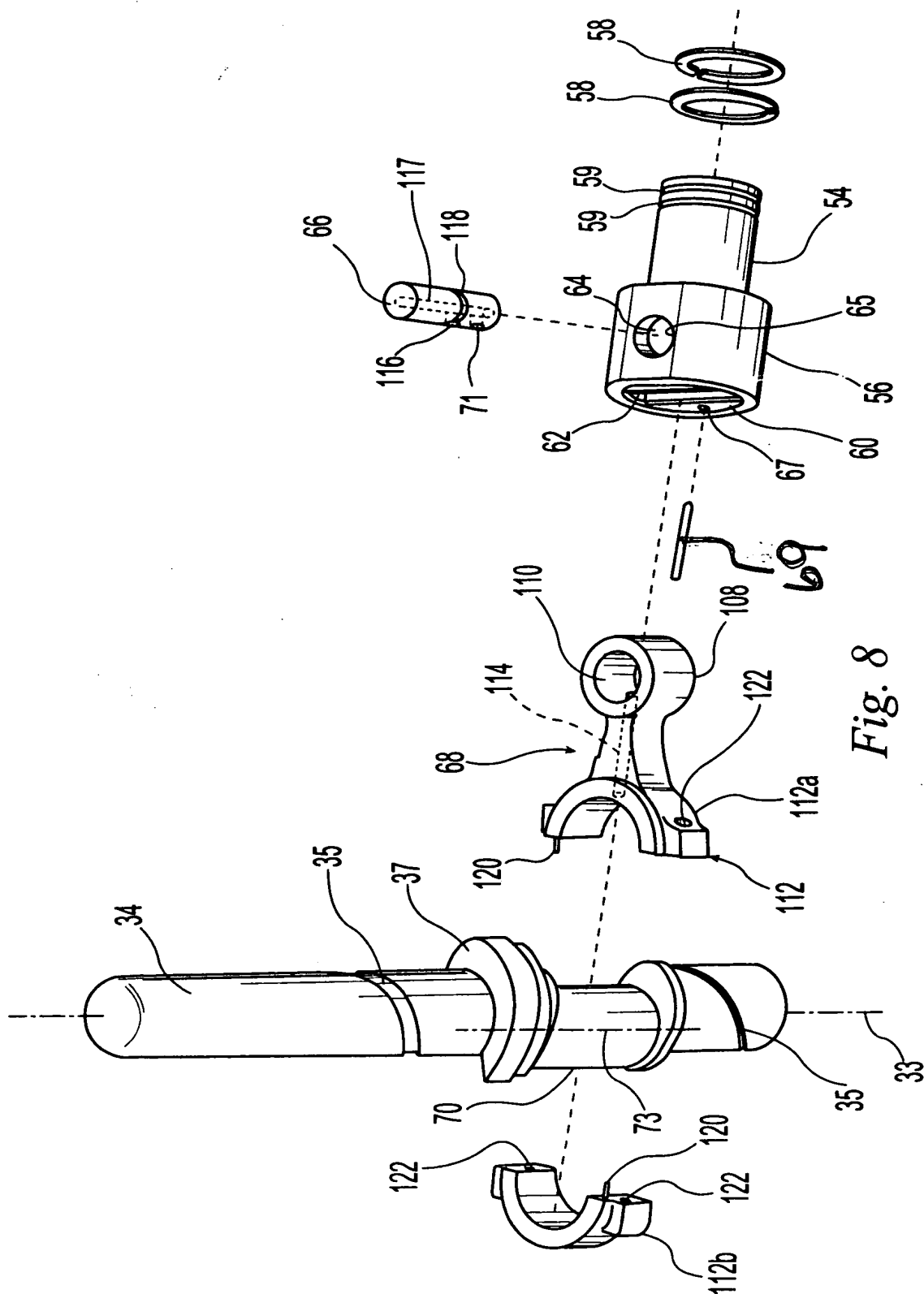


Fig. 8